

Applicants' remarks and amendments, filed on September 5, 2008, have been carefully considered. No claims have been canceled; new claims 21-25 have been added.

Claims 1-25 are now pending in this application.

### *New Ground of Rejection*

The following New Ground of Rejection is being made in view of Applicants' addition of new claims 21-25.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 21-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.**

The subject matter recited in the claims but not described in the Specification are the limitations “**up to** a reflux temperature” and “**about** 90°C” (emphasis added by the Examiner).

See the Examples of Applicants' Specification, which recite phrases such as "heated to 90°C" (Examples 2 and 3) and "heated to a reflux temperature" (Example 1).

*Claim Rejections - 35 USC § 103*

**3. Claims 1-20 stand, and new claims 21-25 are, rejected under 35 U.S.C. 103(a) as being unpatentable over Mullin (U. S. Patent No. 3,326,827).**

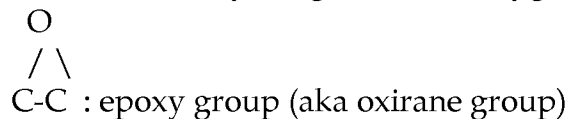
Mullin teaches an epoxide-treated titanium dioxide pigment (col. 1, lines 10-15), said epoxide selected from the group consisting of epoxidized esters of fatty acids and epoxy intermediates, said esters being selected from the group of esterified fatty acids having a chain length of from 1-18 carbon atoms, esterified with alcohols of from 1-10 carbon chain length. See col. 2, lines 33-44 of Mullin, as well as col. 2, lines 10-25, which discloses the formation of epoxy intermediates. This disclosure is considered to read upon the "epoxy compound having a general formula" as recited in **claims 1, 5, 9, and 16**.

Application of the epoxide to the TiO<sub>2</sub> pigment may be effected in any one of several ways, such as dissolving the epoxide in a suitable solvent to form a thin epoxide solution, and then either add the pigment to the epoxide solution to form a slurry (or, as an alternative, spray the epoxide solution onto the pigment), after which the treated pigment is dried to volatilize the solvent (**claim 25**), followed by dry milling, to insure a uniform coating of the epoxide on the discrete particles of pigment. See col. 3, lines 22-58 of Mullin. This disclosure is considered to read upon **claims 13-15 and 20**.

Art Unit: 1793

Epoxides included within those described above will have oxirane oxygens in the range of 2-9% by weight, which corresponds to an epoxy equivalent weight range of 178-800:

For 9% by weight oxirane oxygens:



Number of epoxy groups (and number of oxirane oxygens) = X

$$X(16)/\text{MW} = 0.09$$

$$16X = 0.09\text{MW}$$

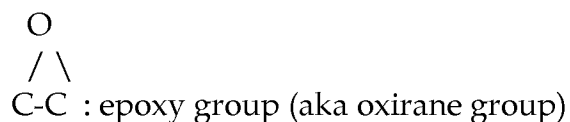
$$X = 0.005625\text{MW}$$

$$\text{EEW} = \text{MW}/X$$

$$\text{EEW} = \text{MW}/0.005625\text{MW}$$

$$\text{EEW} = 178$$

And, for 2% by weight oxirane oxygens:



Number of epoxy groups (and number of oxirane oxygens) = X

$$X(16)/\text{MW} = 0.02$$

$$16X = 0.02\text{MW}$$

$$X = 0.00125\text{MW}$$

$$\text{EEW} = \text{MW}/X$$

$$\text{EEW} = \text{MW}/0.00125\text{MW}$$

$$\text{EEW} = 800$$

See col. 3, lines 59-66 of Mullin; this disclosure is considered to read upon **claims**

**2, 6, 10, and 17.**

Exemplary epoxides include alkyl esters (i.e., methyl, ethyl, and acetyl esters) of tall oil fatty acids, polyepoxides, diepoxide polymers, and glycidyl polyethers. See col. 3, line 67 to col. 4, line 4 of Mullin; this disclosure is considered to read upon **claims 3, 4, 7, 8, 11, 12, 18 and 19**.

The epoxide-treated pigments of Mullin have "the unique effect of improving the dispersibility of the pigment...as well as enhancing the color of a polyvinyl resin made therefrom." See col. 4, lines 5-13 of Mullin, as well as col. 5, lines 15-67, which discloses exemplary tests for dispersing the epoxide coated pigments. This disclosure is considered to read upon the claim limitations "pigment dispersion" and "dispersing agent" in **claim 5**.

Mullin does not disclose a numerical temperature at which the "treated pigment is dried to volatilize the solvent", i.e., Applicants' claimed "elevated temperature".

However, Example 1 of Mullin depicts an embodiment in which  $\text{TiO}_2$  pigment is added, as an aqueous slurry, to an epoxide solution consisting of polyepoxide linseed oil dissolved in acetone, and the mixture is dried, milled, and micro-pulverized. See col. 4, lines 21-28 of Mullin. In view of this example, and of the reference's teachings regarding drying the treated pigment to volatilize the solvent (e.g., acetone, which has a boiling point of  $56.3^\circ\text{C}$ ), one of ordinary skill in the art would reasonably expect that the drying and subsequent volatilization would take place at an "elevated temperature", such as at a temperature above the solvent's boiling point.

Further, Applicants' new **claims 21-24** recite that the pigment particles are reacted with the epoxy compound at either "up to a reflux temperature of a slurry...", or "at about 90°C". In addition to the teachings of Mullin regarding the application of the epoxide to the TiO<sub>2</sub> pigment as set forth above (col. 3, lines 22-58), the reference also discloses in claims 11-13 the formation of an epoxide dispersing medium comprising water or acetone. Therefore, it would have been obvious to one skilled in the art at the time the invention was made that, if an epoxide dispersing medium comprising water is applied to the pigment, after which the pigment is dried to volatilize the solvent (i.e., water), such volatilization would occur at a temperature near the boiling point of water, i.e., "about 90°C". Further, if the skilled artisan would appreciate that if an epoxide dispersing medium comprising water and acetone were employed, volatilization of said medium would occur near the "reflux temperature" of said medium.

### *Response to Arguments*

Applicants' remarks regarding the telephonic interview between Applicants' Counsel and Examiner Hailey on July 31, 2008, are correct.

In response to Applicants' arguments regarding the teachings of Mullin, the Examiner respectfully maintains her position as set forth in the previous Office Action. Although the reference's "mere disclosure of drying does not imply by heating", one of ordinary skill in the art would reasonably expect the prior art's drying to encompass any conventional drying technique.

*Declaration under 37 CFR 1.132*

4. **The Declaration under 37 CFR 1.132 filed September 5, 2008, is insufficient to overcome the rejection of claims 1-20 based upon Mullin (U. S. Patent No. 3,326,827) as set forth in the last Office action because:**

The Declaration is erroneous in the recitation of "28 U.S.A. Section 1746"; the recitation should be "28 U.S.C. Section 1746".

*Conclusion*

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA L. HAILEY whose telephone number is

(571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/  
Primary Examiner, Art Unit 1793  
December 10, 2008